



## Our Experience of Topical Use of the Hemostatic Agent Hemoben In the Treatment of Patients With Deep Burns

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**Abstract:** This study has shown that, to improve the results of early necrectomy with autodermoplasty in burned patients by using the local hemostatic agent hemoben. Material and methods: The results of treatment of 25 victims with thermal injuries (10 women and 15 men) aged 18 to 70 years who were treated in the combustiolog department of the Samarkand branch of the Russian Center for Scientific and Cardiomyopathy in 2020-2023 were analyzed. The use of hemostatic hemoben after necrectomy followed by autodermoplasty in all cases contributed to the complete healing of donor sites on the 7<sup>th</sup> day, complete engraftment of the skin autograft with complete restoration of the defect was achieved by the 12th day after the operation. Local single application to the wound after necrectomy of the hemostatic drug Hemoben with autodermoplasty promotes rapid adhesion of the graft, provides quick and complete engraftment of skin flaps.

**Key words:** deep burns, early necrectomy with autodermoplasty, hemostatic drug Hemoben.

### Introduction.

In the general structure of trauma, thermal injuries occupy the 2nd-3rd place. The proportion of deep burn injuries requiring surgical treatment is high. The essence of the surgical treatment of deep burns consists in one way or another to compensate for the defect of the skin formed as a result of their necrosis. The most common method of restoring the integrity of the skin is free skin plasty. Plastic closure of a burn wound is preceded by wound preparation, which involves clearing the wound of necrotic tissue and forming a bed that is suitable for grafting. Preparation of burn wounds for autodermoplasty (ADP) can be carried out at different times using different methods that are more or less aggressive. In all cases,

the final step is the closure of the wound surface [2]. Historically, there have been two main areas of surgical treatment for burns [5]: 1) autodermoplasty of granulating post-burn wounds after spontaneous necrotic tissue rejection or chemical necrectomy; 2) early surgical necrectomy before inflammation develops in the wound followed by autodermoplasty. Self-removal of necrotic tissue in deep burns leads to complete clearing of the wound surface after 4-6 weeks. The prolonged existence of a burn scab impedes autodermoplasty, promotes the development of pus-like microflora in the burn wound and the release of toxic substances. Therefore, it is understandable that doctors want to achieve accelerated rejection of necrotic tissues, suppress purulent infection in the wound, and reduce the time required for preoperative preparation for skin grafting. Thanks to early surgical treatment (removal of the burn scab in the first 3-7 days after injury with simultaneous or delayed autodermoplasty), there are opportunities to change the course of the burn disease and to interrupt its course. The terms of preparation of burn wounds for autodermoplasty, the time of restoration of skin integrity, the duration of hospital treatment, and the number of infectious complications are reduced.

But early surgical necrectomy is a rather traumatic operation, which can be accompanied by profuse blood loss. According to Y.I. Tyurnikov and A.A. Evteev [4], blood loss from the wound surface is at least 250-300 ml in 10%.

According to other studies [3], early excision of dead tissues in an area of 100 cm<sup>2</sup> leads to the blood loss of 76 ml, and when granulations are removed in the same area 64 ml are lost. It should also be borne in mind that autodermoplasty involves the formation of extensive "donor" wound surfaces, often equal in area to those of burns. Given the surgical risks associated with blood loss and pain impulses, the increased area of lost skin puts this type of surgery in a special place. Therefore, at present, when treating deep burns in conditions of blood loss, the combustiologist faces the task of minimizing intraoperative blood loss during wound preparation for autodermoplasty (ADP) and in the process of surgical restoration of the lost skin surface.

**Objective:** To improve the results of early necrectomy with autodermoplasty in burned patients by using the local haemostatic agent Chemoben.

**Material and methods:** The study was based on the analysis of treatment outcomes of 25 patients (10 women and 15 men) with thermal lesions aged 18 to 70 years old, who were treated at the Combustiology Department of Samarkand Branch of RCEMS in 2020-2023. Most of the injuries were caused by flames (23 victims), there were also burns by boiling water (9) and contact burns (3). The total area affected in the patients ranged from 5 to 20% of the body surface, and deep burns of Shb-IV degree up to 10%. All patients underwent early necrectomy to healthy tissue with the occurrence of capillary bleeding simultaneously with ADP. Hemostasis was performed with Hemoben haemostatic powder (10 mg powder) [1] during necrectomy and dressings.

**Results of the study:** clinical efficacy was assessed according to such criteria as the amount and nature of the discharge; wound bleeding; time of epithelialization of the donor sites, transplanted autografts; completeness of epithelialization; severity of wound pain. Surgical intervention in 25 patients with deep burns involved the use of the haemostatic agent Chemoben to stop bleeding after excision of necrotic skin and subcutaneous structures. Our studies have shown that early surgical necrectomy and removal

of split autografts from donor sites is accompanied by blood loss (6-10 ml of blood per 100 cm<sup>2</sup> area), but immediately after application of hemostatic powder Chemoben the bleeding ceased completely and the wound surface became shiny due to the film adhered to it. Pain sensation was negligible. When closing the wound defect with a donor autologous flap, good adhesion of the skin flap to the underlying wound was observed. Examination on the following day showed no signs of necrosis of the skin graft. The donor wound was also clean, there were no signs of infection or pain.

On the 3rd day after the operation the patients had positive dynamics of the skin graft healing. There was no discharge from the wound. There were no signs of inflammation and infection of the wound at the donor site.

On the 7th day after the ADP there was almost complete engraftment of the skin graft, the suture line was a clear thin line, without any signs of redness or infiltration. The skin graft was soft, elastic, pale pink in colour. There are no signs of infection. The donor site was completely epithelialised, leaving a thin elastic scar without signs of hypertrophy or inflammation, painless.

On the 11th day, there was complete engraftment of the skin autograft with complete repair of the defect with minor contraction of the defect area.

**Table 1**  
**Clinical results of the application of hemostatic Chemoben powder**

| Result   | Chemoben, n=35     | Traditional method, n=30 |
|--|--------------------|--------------------------|
| Blood loss from wounds and donor sites           | 15-20 ml           | 130-150 ml               |
| Severity of wound pain                           | Minor              | Painful                  |
| Condition of skin grafts                         | No necrosis        | Signs of edge necrosis   |
| Nature of wound discharge                        | No wound discharge | <i>Sucrose discharge</i> |
| Timing of epithelialisation of donor sites, days | 6,5±1,0            | 8,0±1,0                  |
| Complete engraftment of the skin graft, days     | 11,0±1,0           | 12,5±2,0                 |

Thus, application of the haemostatic agent Chemoben after necrectomy followed by autodermoplasty in all cases contributed to complete healing of the donor sites on the 7th day and complete engraftment of the skin autograft with complete restoration of the defect by the 12th day after surgery.

### Conclusions:

1. The use of Chemoben during autodermoplasty after early necrectomy provides complete hemostasis and reduced wound pain.
2. Local single application of the hemostatic preparation "Chemoben" to the wound after necrectomy at autodermoplasty promotes the fast adhesion of a transplant, provides fast and complete engraftment of a skin flap.

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